



Practice Abstract 2 - Farmtopia Semantic Model

Summary for practitioners

Problem:

A key technical requirement for agricultural digital solutions has been interoperability between systems and modules. Different agricultural digital solutions must be able to exchange data and know what the data means. This requires a standardized vocabulary (or ontology) that can be used by different components.

Solution:

The Farmtopia project developed a “Common Semantic Model” building on past work and existing recognized standards for the agricultural domain. Reuse was made of existing models as much as possible so that nearly all concepts are well recognized and understood. The model is formally expressed and follows the FAIR data principles (Findable, Accessible, Interoperable, Reusable).

Benefits:

- **Interoperability:** Connects diverse platforms, reducing manual data management.
- **Data Control:** Empowers users to manage and secure their data
- **Scalability:** Adaptable for farms of various sizes, cooperatives and advisors.

Practical Recommendations:

- **For Farmers:** Check that your applications use semantics and are thus interoperable.
- **For Farm Advisors:** Take advantage of interoperability to unify data for benchmarking purposes.
- **For Agricultural Digital Solution developers:** Make sure any future software development uses the Farmtopia CSM to ensure ongoing compatibility and interoperability.

```
{
  "contains": [
    {
      "@id": "VineParcel",
      "@type": "fsm:FarmSite",
      "name": "Vine parcel",
      "nationalIdentifier": "123456789",
      "activity": {
        "@id": "A121Activity",
        "@type": "foodie:EconomicActivityNACEValue",
        "vocabCode": "A1.2.1 - Growing of grapes"
      },
      "geometry": {
        "@id": "geometry2",
        "@type": "geosparql:Geometry",
        "geoJson": {
          "type": "Polygon",
          "coordinates": [
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          ]
        }
      },
      "hasArea": {
        "@id": "VineParcelArea",
        "@type": "qudt:QuantityValue",
        "numericValue": "48",
        "unitOfMeasure": "unit:HA"
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      "contains": [
        {
          "@id": "MerlotVinePlot",
          "@type": "fsm:Plot",
          "name": "Merlot vine plot",
          "landType": {
            "@id": "ArableLand1",
            "@type": "obo:ENVO_01001177",
            "label": "Arable land"
          },
          "geometry": {
            "@id": "geometry3",
            "@type": "geosparql:Geometry",
            "geoJson": {
              "type": "Polygon",
              "coordinates": [
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          "hasIrrigationSystem": {
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            "@type": "pcsm:IrrigationSystem",
            "hasIrrigationType": "Drip Irrigation"
          },
          "plantsPerHa": "5000",
          "contains": [
            {
              "@id": "MerlotVineInstances",
              "@type": "pcsm:Crop",
              "cropVariety": "Merlot",
              "agroVocCode": "c_8483",
              "epoCode": "VITVI",
              "OBOClass": {
                "@id": "http://purl.obolibrary.org/obo/FOODON_00002591"
              },
              "hasPlantDate": "2022-01-01",
              "hasHarvestDate": "2022-01-01"
            }
          ]
        }
      ]
    }
  ]
}
```

Farmtopia Semantic Model (FSM) example serializations

Further information

- Detailed documentation, integration guides, and support at: <https://gitlab.com/Farmtopia> (Resources include tutorials and best practices to maximize the module's utility)

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About this Practice Abstract and Farmtopia

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Permalink: [EU CAP Network](#)

This practice abstract was elaborated in the Farmtopia project, based on the EIP AGRI practice abstract format.

Farmtopia: The project is running from September 2023 to August 2026. The overall goal of Farmtopia (**GA No.: 101083541**) is to democratize digital farming to empower small and medium farms.
Website: <https://farmtopia.eu/>

Green Supply Chain: As part of the Farmtopia project, Green Supply Chain is the leader of work package 2 (WP2) “Business and Governance Models”, and it will co-develop a Technology Code of Conduct.
Website: <https://www.greensupplychain.eu/>

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